



PROJECTS

The LRC would like to thank our generous sponsors (2018-20):

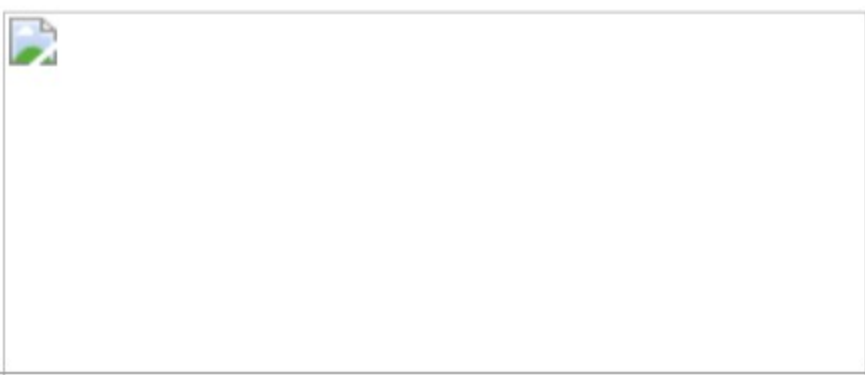
- The John Templeton Foundation
- The Gordon & Betty Moore Foundation
- The Richard Lounsbery Foundation
- The National Science Foundation (NSF)
- Defense Advanced Research Projects Agency (DARPA)
- Defense Threat Reduction Agency (DTRA)
- NASA/JPL

PROJECTS UNDER DEVELOPMENT

A number of funded projects are currently under development at the LRC, in areas such as Cognition and AI, Computational Chemistry, Pediatric Health and Information Discovery. We will post more information as projects mature!

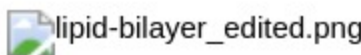
ADVANCED PROJECTS

Origins of Biological Complexity



How did biological systems become complex in the first place? Why do some cells/systems, like in prokaryotes, remain essentially simple? Why does evolution come up with different solutions even when the underlying genetic information is conserved? Researchers at the LRC are trying to answer these questions by uniquely examining the intersection of evolutionary and physical processes through computational and experimental means. Their current focus is on protein-protein interactions, which essentially underpin nearly all biophysical and biochemical aspects of biological systems.

Life as Information



When it comes to storing information in a cell, DNA/RNA are far from the complete story; in fact, a cell is teeming with information that is reflected in its choice of structurally relevant molecules, the organization of its ultrastructure, gradients, processes, flows and a variety of other components. Information is also gained as cells differentiate and organize into higher order structures such as tissues and organs. LRC scientists aim to study the information content of cells and higher-order structures, and also plan to explore the evolution of read-write systems, with the exciting possibility of engineering and rewiring such systems.

SymBioNet

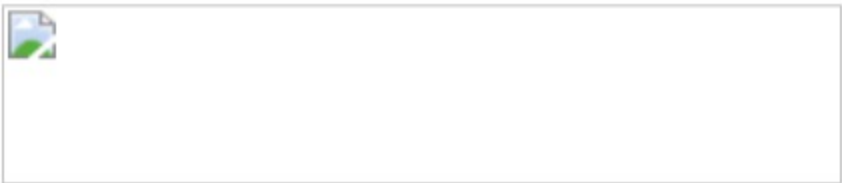


SymBioNet is an international consortium of researchers interested in rapidly moving the field of Symbiosis forward. The consortium is organized as a "network-of-networks", with prominent labs serving as nodes to facilitate further in-country and local interactions. [Read more >](#)

Boundaries of Life

The Boundaries of Life (BoL) Initiative seeks to uncover highly divergent forms of life on earth and in doing so to advance microbiology and fundamental unanswered questions in biology, including:

1. What are the fundamental parameters and bounds of life?
2. Has life originated more than once?
3. How likely is life to exist elsewhere in the universe?



The BoL team brings together a group of physicists and biologists from Stanford University, California Institute of Technology and Global Viral/LRC with expertise in specimen collection, development of assays for studying microscopic life, and the fundamental study of the chemistry and physics of microbial-scale life. The project's primary objectives are to chart the currently unmapped diversity of nucleic acid-based life and to develop and deploy assays for the detection of shadow life in a range of specimens from Earth.

Phase I End Date : August, 2017

Phase IIA End Date: September 2020

Phase IIB End Date: March 2022

Participating institutions (& PIs):

LRC: Shailesh Date, Nathan Wolfe (Only Phases I & IIA)
Stanford University: Steve Quake
Caltech: Grant Jensen, Rob Phillips
Collaborators: Joint Genome Institute & NASA/JPL.

LEGACY PROGRAMS

The LRC, formerly [Global Viral](#) (GV) (which in turn was previously known as Global Viral Forecasting Institute (GVFI)), was initially founded as an organization focused on the study of infectious diseases, their transmission between animals and humans, and the risk involved with their global spread. However, these areas of research are now shifted to [Metabiota](#), an independent company that focuses on risk analysis associated with such diseases.

The LRC is now focused on the study of complex systems, and some projects studying the diversity, ecology and evolution of microbes. Our legacy, however, is very important to us. To access information about our legacy programs, some of which may no longer be current, please use the links below:

- [Africa-based programs](#)
- [Asia-based programs](#)



LABORATORY FOR RESEARCH IN
COMPLEX SYSTEMS

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